

REMARKS

In the September 29, 2008 Office Action, all of pending claims 1-8 stand rejected in view of prior art. No other objections or rejections were made in the Office Action.

Status of Claims and Amendments

In response to the September 29, 2008 Office Action, Applicant has amended claims 1, 4, 5 and 7 as indicated above. Claim 3 has been cancelled by the current Amendment. Thus, claims 1, 2 and 4-8 are pending, with claim 1 being the only independent claim. Reexamination and reconsideration of the pending claims are respectfully requested in view of above amendments and the following comments.

Rejections - 35 U.S.C. § 102

In paragraphs 2-6 of the Office Action, claim 1, 2, 5 and 7 stand rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent Publication No. 60-92789 (Murata et al.). In response, Applicant has amended independent claim 1 to more clearly define the present invention over the prior art of record. This rejection is respectfully traversed, especially in view of the amendments to independent claim 1.

In particular, independent claim 1 now requires, *inter alia*,
a rotation mechanism including a cylinder having an annular cylinder chamber;
a driving mechanism arranged to drive the rotation mechanism;
a casing containing the rotation mechanism and the driving mechanism;
an annular piston disposed in the cylinder chamber to be eccentric to the cylinder, the annular piston dividing the cylinder chamber into an outer compression chamber and an inner compression chamber; and

a blade disposed in the cylinder chamber to divide each of the inner and outer compression chambers into a high-pressure side and a low-pressure side, the rotation mechanism compressing a fluid by relatively rotating the cylinder and the piston,

one of the inner and outer compression chambers being a low-stage side compression chamber arranged to compress a low-pressure fluid into an intermediate-pressure fluid, and the other of the inner and outer compression chambers being a high-stage side compression

chamber arranged to compress the intermediate-pressure fluid compressed in the low-stage side compression chamber into a high-pressure fluid,

the casing having an intermediate-pressure space into which the intermediate-pressure fluid compressed in the low-stage side compression chamber is introduced, with the driving mechanism being disposed in the intermediate-pressure space, and

the casing having a gas injection pipe connected to the casing that is configured to accommodate gas that is injected into the intermediate pressure space. Clearly, this structure is *not* disclosed or suggested by the '789 publication.

In other words, the arrangement of independent claim provides a driving mechanism (e.g., an electric motor) disposed in an intermediate-pressure space, and a gas pipe configured to accommodate (receive/supply) fluid from/to this intermediate-pressure space. As a result, for example, the intermediate-pressure space fluid will be cooled by the gas refrigerant. Accordingly, the driving mechanism (e.g., an electric motor) will also be cooled due to the driving mechanism (e.g., an electric motor) being provided in this intermediate-pressure space. Therefore, reliability and motor efficiency will increase due to this driving mechanism (e.g., an electric motor) being cooled. Due to the cooling of the driving mechanism (e.g., an electric motor) which drives the rotation mechanism having the two compression chambers, further increase in efficiency and, at the same time, increased reliability are possible.

The '789 publication fails to disclose or suggest a compression mechanism with two stages arranged to compress fluids at a low pressure and an intermediate pressure, respectively, as now claims. Rather, in the '789 publication, a common fluid supply line 8 supplies fluid at a common pressure to the so-called inner and outer compression mechanisms, and the so-called inner and outer compression chambers compress this common pressure fluid and output a resultant compressed fluid to a common space. In other words, the '789 publication only discloses a fluid machine provided with simple an annular piston (with common inlets and outlets). Thus, *contrary to the assertions of the Office Action the '789 publication does not compress liquid in two steps, i.e., from two different pressures (low and intermediate pressures) to two different pressures (intermediate and high pressures), respectively.*

It is well settled under U.S. patent law that for a reference to anticipate a claim, the reference must disclose each and every element of the claim within the reference. Therefore, Applicant respectfully submits that claim 1, as now amended, is not anticipated by the '789

publication. Accordingly, withdrawal of this rejection of independent claim 1 is respectfully requested.

Moreover, Applicant believes that dependent claims 2, 5 and 7 are also allowable over the prior art of record in that they depend from independent claim 1, and therefore are allowable for the reasons stated above. Also, dependent claims 2, 5 and 7 are further allowable because they include additional limitations. Thus, Applicant believes that since the prior art of record does not anticipate the independent claim 1, neither does the prior art anticipate the dependent claims. Accordingly, withdrawal of this rejection of dependent claims 2, 5 and 7 is also respectfully requested.

Rejections - 35 U.S.C. § 103

In paragraphs 8-52 of the Office Action, claims 1-8 stand rejected under 35 U.S.C. §103(a) as follows:

- Rejection (A) Paragraphs 8-11 - Claim 3 is rejected as being unpatentable over the '789 publication in view of Japanese Patent Publication No. 2001-207983 (Yoda);
- Rejection (B) Paragraphs 12-15 - Claim 4 is rejected as being unpatentable over the '789 publication in view of U.S. Patent Application Publication No. 2004/0161345 (Choi et al.);
- Rejection (C) Paragraphs 16-21 - Claim 6 is rejected as being unpatentable over the '789 publication in view of U.S. Patent No. 4,553,903 (Ashikian);
- Rejection (D) Paragraphs 22-26 - Claim 8 is rejected as being unpatentable over the '789 publication in view of U.S. Patent No. 6,077,058 (Saitou et al.);
- Rejection (E) Paragraphs 27-37 - Claims 1-3, 5 and 7 are rejected as being unpatentable over the '983 publication in view of the '789 publication;
- Rejection (F) Paragraphs 38-41 - Claim 4 is rejected as being unpatentable over the '983 publication and the '789 publication, in further view of the '345 publication;
- Rejection (G) Paragraphs 42-47 - Claim 6 is rejected as being unpatentable over the '983 publication and the '789 publication, in further view of the '903 patent; and
- Rejection (H) Paragraphs 48-52 - Claim 8 is rejected as being unpatentable over the '983 publication and the '789 publication, in further view of the '058 patent.

In response, Applicants have amended independent claim 1 as mentioned above. Applicants respectfully traverse these rejections, especially in view of the amendments to independent claim 1, as explained below.

Rejection (A) – Claim 3

With respect to rejection (A), *contrary to the assertions of the Office Action the '789 publication does not compress liquid in two steps, i.e., from two different pressures (low and intermediate pressures) to two different pressures (intermediate and high pressures), respectively*, as explained above. The '983 publication fails to account for this deficiency in the '789 publication. In fact, the Office Action merely relies on the '983 publication to allegedly disclose a gas injection pipe, and the Office Action acknowledges that the '983 publication fails to disclose a piston, blade and two stages of compression as set forth in previously presented claim 1 (See page 8 of the Office Action). Thus, even if these references were somehow combined as suggested in the Office Action, the hypothetical device created would not include all of the features of independent claim 1, especially as now amended. Moreover, the '983 publication discloses a vane-type compression machine, and is not provided with an driving mechanism (e.g., electric motor) in an intermediate-pressure space of its casing, as now claimed. Thus, this reference cannot reasonably teach one of ordinary skill in the art to connect the pipe 28 to such a space. In fact, if the CO₂ gas pipe 28 were connected to the motor space of the '789 publication, such a pipe would serve no purpose whatsoever since the motor space in the '789 publication contains relatively high pressure fluid to be output from the pipe 16. In view of the above arguments and amendments, this rejection as applied to previously presented claim 3 is untenable, and withdrawal of this rejection is respectfully requested.

Rejection (B) – Claim 4

With respect to rejection (B), *contrary to the assertions of the Office Action the '789 publication does not compress liquid in two steps, i.e., from two different pressures (low and intermediate pressures) to two different pressures (intermediate and high pressures), respectively*, as explained above. The '345 publication fails to account for this deficiency in the '789 publication. In fact, the Office Action merely relies on the '345 publication to allegedly disclose a variable *capacity* compressor. Thus, even if these references were somehow combined as suggested in the Office Action, the hypothetical device created would not include all of the features of independent claim 1, especially as now amended. Moreover,

the '345 publication discloses varying capacity through control of various ports, *not* by variably controlling rotation speed of the driving mechanism. Thus, the '345 publication fails to disclose the arrangement of claim 4. In view of the above arguments and amendments, this rejection of claim 4 is untenable, and withdrawal of this rejection is respectfully requested.

Rejection (C) – Claim 6

With respect to rejection (C), *contrary to the assertions of the Office Action the '789 publication does not compress liquid in two steps, i.e., from two different pressures (low and intermediate pressures) to two different pressures (intermediate and high pressures), respectively*, as explained above. The '903 patent fails to account for this deficiency in the '789 publication. In fact, the Office Action merely relies on the '903 patent to allegedly disclose an intermediate pressure space below a high pressure space. Thus, even if these references were somehow combined as suggested in the Office Action, the hypothetical device created would not include all of the features of independent claim 1, especially as now amended. Moreover, the '903 patent is not provided with a driving mechanism in the so-called intermediate-pressure space of its casing, and it also does not carry out a gas injection as set forth in claim 1. In view of the above arguments and amendments, this rejection of claim 6 is untenable, and withdrawal of this rejection is respectfully requested.

Rejection (D) – Claim 8

With respect to rejection (D), *contrary to the assertions of the Office Action the '789 publication does not compress liquid in two steps, i.e., from two different pressures (low and intermediate pressures) to two different pressures (intermediate and high pressures), respectively*, as explained above. The '058 patent fails to account for this deficiency in the '789 publication. In fact, the Office Action merely relies on the '058 patent to allegedly disclose a swing bushing. Thus, even if these references were somehow combined as suggested in the Office Action, the hypothetical device created would not include all of the features of independent claim 1, especially as now amended. Moreover, the '058 patent is not provided with a driving mechanism in the so-called intermediate-pressure space of its casing, and it also does not carry out a gas injection as set forth in claim 1. In view of the above arguments and amendments, this rejection of claim 8 is untenable, and withdrawal of this rejection is respectfully requested.

Rejection (E) – Claims 1-3, 5 and 7

With respect to independent claim 1, the Office Action acknowledges that the '983 publication fails to disclose a piston, blade and two stages of compression as set forth in previously presented claim 1 (See page 8 of the Office Action). However, the Office Action asserts that the '789 publication discloses these features. As explained above, *contrary to the assertions of the Office Action the '789 publication does not compress liquid in two steps, i.e., from two different pressures (low and intermediate pressures) to two different pressures (intermediate and high pressures), respectively*. Thus, even if these references were somehow combined as suggested in the Office Action, the hypothetical device created would not include all of the features of independent claim 1, especially as now amended. The dependent claims 2, 5 and 7, therefore, cannot be disclosed or suggested by this hypothetical combination of references. Moreover, the '983 publication discloses a vane-type compression machine, and is not provided with a driving mechanism (e.g., electric motor) in an intermediate-pressure space of its casing, as now claimed. Thus, this reference cannot reasonably teach one of ordinary skill in the art to connect the pipe 28 to such a space. In view of the above arguments and amendments, this rejection of claims 1, 2, 5 and 7 is untenable, and withdrawal of this rejection is respectfully requested.

Rejection (F) – Claim 4

The deficiencies of the hypothetical combination of the '789 publication and the '983 publication are discussed above with respect to rejection (E). The '345 publication fails to account for the deficiencies in this hypothetical combination. In fact, the Office Action merely relies on the '345 publication to allegedly disclose a variable *capacity* compressor. Thus, even if these references were somehow combined as suggested in the Office Action, the hypothetical device created would not include all of the features of independent claim 1, especially as now amended. Moreover, the '345 publication discloses varying capacity through control of various ports, *not* by variably controlling rotation speed of the driving mechanism. Thus, the '345 publication fails to disclose the arrangement of claim 4. In view of the above arguments and amendments, this rejection of claim 4 is untenable, and withdrawal of this rejection is respectfully requested.

Rejection (G) – Claim 6

The deficiencies of the hypothetical combination of the '789 publication and the '983 publication are discussed above with respect to rejection (E). The '903 patent fails to account

for the deficiencies in this hypothetical combination. In fact, the Office Action merely relies on the '903 patent to allegedly disclose an intermediate pressure space below a high pressure space. Thus, even if these references were somehow combined as suggested in the Office Action, the hypothetical device created would not include all of the features of independent claim 1, especially as now amended. Moreover, the '903 patent is not provided with a driving mechanism in the so-called intermediate-pressure space of its casing, and it also does not carry out a gas injection as set forth in claim 1. In view of the above arguments and amendments, this rejection of claim 6 is untenable, and withdrawal of this rejection is respectfully requested.

Rejection (H) – Claim 8

The deficiencies of the hypothetical combination of the '789 publication and the '983 publication are discussed above with respect to rejection (E). The '058 patent fails to account for the deficiencies in this hypothetical combination. In fact, the Office Action merely relies on the '058 patent to allegedly disclose a swing bushing. Thus, even if these references were somehow combined as suggested in the Office Action, the hypothetical device created would not include all of the features of independent claim 1, especially as now amended. Moreover, the '058 patent is not provided with a driving mechanism in the so-called intermediate-pressure space of its casing, and it also does not carry out a gas injection as set forth in claim 1. In view of the above arguments and amendments, this rejection of claim 8 is untenable, and withdrawal of this rejection is respectfully requested.

Under U.S. patent law, the mere fact that the prior art can be modified does *not* make the modification obvious, unless an *apparent reason* exists based on evidence in the record or scientific reasoning for one of ordinary skill in the art to make the modification. See, KSR Int'l Co. v. Teleflex Inc., 127 S.Ct. 1727, 1741 (2007). The KSR Court noted that obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." *Id.* at 1741. The current record lacks any apparent reason, suggestion or expectation of success for combining the patents to create Applicants' unique arrangement of independent claim, as explained above.

Accordingly, in view of the above amendments and arguments, Applicant respectfully requests withdrawal of the rejections (A)-(H).

Prior Art Citation

In the Office Action, additional prior art references were made of record. Applicant believes that these references do not render the claimed invention obvious.

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In view of the foregoing amendment and comments, Applicant respectfully asserts that claims 1, 2 and 4-8 are now in condition for allowance. Reexamination and reconsideration of the pending claims are respectfully requested.

Respectfully submitted,

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Dated: March 20, 2009

S:\03-MAR09-YTYDK-US065033 Amendment (Applicants singular).doc